SECTION 14C

EXCAVATION & BACKFILLING

14.28 SCOPE

This section covers all excavation, trenching and backfilling for pipe lines, complete.

14.29 EXISTING IMPROVEMENTS

The Contractor shall maintain in operating condition and protect from damage all existing improvements including utilities, roads, streets, sidewalks, drives, power and telephone lines, gas lines, water lines, sewers, gutters and other drains encountered, and repair to the satisfaction of the Engineer any aerial, surface or subsurface improvements damaged during the course of the work. Where and if shown on the plans, the locations and existence or nonexistence of underground utilities are not guaranteed. The Contractor shall contact the various utility companies to determine and/or verify such information prior to proceeding with the work. He shall make reasonable and satisfactory provisions for the maintenance of traffic on streets, drives, walkways and at street crossings and if necessary to provide temporary walkways and bridges for crossing of the open trench as directed. Work shall not commence within Augusta right-of-way until a Right-of-Way Encroachment Permit is obtained from the Public Works Deparment.

14.30 EXCAVATION

All excavation of every description and of whatever substances encountered shall be performed to the depths indicated on the drawings or as specified herein. Excavation shall be made by the open cut method except as otherwise specified or shown on the drawings. Excavation methods shall generally meet or exceed Occupational Safety and Health Administration (OSHA) construction industry standards.

All excavated materials not required for fill or backfill shall be removed and wasted as directed. The banks of shallow trenches shall be kept as nearly vertical as practicable and where required shall be properly sheeted and braced. Except where otherwise indicated, trench bottoms shall be not less than 12 inches wider nor more than 16 inches wider than the outside diameter of the pipe to be laid therein, and shall be excavated true to line, so that a clear space of not less than 6 inches nor more than 8 inches in width is provided on each side of the pipe. The bottom of trenches shall be accurately graded to provide uniform bearing and support for each section of the pipe on undisturbed soil at every point along its entire length, except for portions of the pipe sections where it is necessary to excavate for bell holes and for the proper sealing of pipe joints. Bell holes shall be dug after the trench bottom has been graded. Bell holes shall be excavated only to an extent sufficient to permit accurate work in the making of the joints and to insure that the pipe, for a maximum of its length will rest upon the prepared bottom of the trench. Depressions for joints other than mechanical shall be made in accordance with the recommendations of the joint manufacturers for the particular joint used. Excavation for structures and other accessories shall be sufficient to leave at least 12 inches in the clear between their outer surfaces and the embankment or timber which may be used to hold the bank and protect them. Where damage is liable to result from withdrawing sheeting, the sheeting will be ordered to be left in place. Except at locations where excavation of rock from the bottoms of trenches is required, care shall be taken not to excavate below the depths indicated. Where rock excavation is required, the rock shall be excavated to a minimum overdepth of 4 inches below the normal required trench depth. The overdepth rock excavation and all excess trench excavation shall be backfilled with loose, moist earth, thoroughly tamped. Rock is defined as materials which are so hard or cemented that the excavation of such material requires blasting. The excavation shall proceed in a conventional manner with satisfactory effort made to remove hard materials before the Engineer makes a determination of need for blasting. Predrilling and blasting will be allowed, if the Contractor can provide evidence for the Engineer's review that boring logs can and will show that the material can or cannot be excavated. Evidence will be provided for the Engineer's review and approval before predrilling and blasting is undertaken. The excavation and removal of isolated boulders or rock fragments larger than one cubic yard in volume encountered in materials of common excavation shall be classified as rock excavation. Whenever wet or otherwise unstable soil that is incapable of properly supporting the pipe, as determined by the Engineer or indicated on the drawings, is encountered in the trench bottom, such soil shall be removed to a depth required for the lengths designated by the Engineer, and the trench backfilled to trench bottom grade, as

herein specified, with coarse sand, fine gravel, or other suitable material. Backfill with earth under structures will not be permitted and any unauthorized excess excavation below the levels indicated for the foundation of such structures shall be filled with sand, gravel, or concrete, as directed.

14.30.1 Grading and Stacking: All grading in the vicinity of trench excavation shall be controlled to prevent surface ground water from flowing into the trenches. Any water accumulated in the trenches shall be removed by pumping or by other approved methods. During excavation, material suitable for backfilling shall be stored in an orderly manner a minimum distance of one and one-half times the depth of the excavation back from the edges of trenches to avoid overloading and prevent slides or cave-ins. Material unsuitable for backfilling, as determined by the Engineer, shall be removed from the job site and disposed of by the Contractor in a manner as approved by the Engineer.

14.30.2 Shoring and Sheeting: All shoring, sheeting, and bracing required to perform and protect the excavation and to safeguard employees and the public shall be performed. The failure of the Engineer to direct the placing of such protection shall not relieve the Contractor of his responsibility for damage resulting from its omission.

Whenever sheeting is driven to a depth below the elevation of the top of the pipe, that portion of the sheeting below the elevation of the top of the pipe shall not be disturbed or removed. Sheeting left in place shall be cut off not less than 1 foot below finished grade. No sheeting shall be removed until the excavation is substantially backfilled as hereinafter specified.

14.30.3 Water Removal: Where water is encountered, it shall be prevented from accumulating in excavated areas by pumping, well-pointing and pumping, or by other means approved by the Engineer as to capacity and effectiveness. Water removed from excavations

shall be discharged at points where it will not cause injury to public or private property, or the work completed or in progress. All efforts to prevent sedimentation shall be made. Under no circumstances shall trench bottoms be prepared, pipes laid, or appurtenances installed in water. Water shall not be allowed to rise in unbackfilled excavations after pipe or structures have been placed.

14.30.4 Blasting: Explosives are to used only within legal limitations. Before explosives are used, all necessary permits for this work shall be secured and all precautions taken in the blasting operations to prevent damage to private or public property or to persons. The Contractor shall assume full liability for any damage that may occur during the use of explosives. No blast shall be set off within 50 feet of pipe already laid in the trench.

14.30.5 Tree Protection: Care shall be exercised to protect the roots of trees to be left standing. Within the branch spread of the tree, trench shall be opened only when the work can be installed immediately. Injured roots shall be pruned cleanly and backfill placed as soon as possible.

14.31 BACKFILLING

Trenches and other excavations shall not be backfilled until all required tests are performed and the work has been approved by the Engineer. The trenches shall be carefully backfilled with the excavated materials approved for backfilling consisting of earth, loam, sandy clay, sand and gravel, soft shale, or other approved materials. No material shall be used for backfilling that contains mulch, other unstable materials, stones, blasted rock, broken concrete or pavement, or other hard materials having any dimension greater than 4 inches; or large clods of earth, debris, frozen earth or earth with an exceptionally high void content. Backfilling within Augusta right-of-way shall conform to Georgia Department of Transportation and City of Augusta specifications.

For backfill up to a level 1 foot over the top of pressure pipelines and 2 feet above the top of gravity pipelines, only selected materials shall be used. Select materials shall be finely divided material free from debris, organic material and stone, and may be suitable job excavated material or shall be provided by the Contractor from other sources. The backfill shall be placed in uniform layers not exceeding 6 inches in depth. Each layer shall be moistened and carefully and uniformly tamped with mechanical tampers or other suitable tools. Each layer shall be placed and tamped under the pipe haunches with care and thoroughness so as to eliminate the possibility of voids or lateral displacement.

The remainder of the backfill material shall then be placed and compacted above the level specified above. In areas not subject to traffic, the backfill shall be placed in 12 inch layers and each layer moistened and compacted to a density approximating that of the surrounding earth. Under roadways, driveways, paved areas, parking lots, along roadway shoulders and other areas subject to traffic, the backfill shall be placed in 6 inch layers and each layer moistened and compacted to density at least equal to that of the surrounding earth so that traffic can be resumed immediately after backfilling is completed. Any trenches which are improperly backfilled, or where settlement occurs, shall be reopened to the depth required for proper compaction, then refilled and compacted with the surface restored to the required grade compaction. Along all portions of the trenches not located in roadways, the ground shall be graded to a reasonable uniformity and the mounding over the trenches left in a neat condition satisfactory to the Engineer.

Sheeting not specified to be left in place shall be removed as the backfilling progresses. Sheeting shall be removed in such a manner as to avoid caving of the trench. Voids left by the removal of sheeting and shoring shall be carefully filled and compacted. Where, in the opinion of the Engineer, damage is liable to result from withdrawing sheeting, the sheeting will be ordered to be left in place.

14.32 BORING AND JACKING

Where required by the drawings, the pipeline will be installed in a steel casing, placed by boring and jacking. Where boring is required under highways, the materials and workmanship will be in accordance with the standards of the Georgia Department of Transportation or local

authority. Boring and jacking under railroads will be governed by the latest A.R.E.A. standards and those of the railroad involved. The steel casing shall be in accordance with ASTM A252 to the thicknesses shown on the drawings.

14.33 PAVEMENT REMOVAL AND REPLACEMENT

Where necessary existing pavements shall be removed and replaced, the applicable specifications of the Georgia Department of Transportation or local authority shall govern this work. Joints shall be sawed, unless joints equally uniform in the opinion of the Engineer result from other means. Refer to Right-of-Way Encroachment Guidelines for pavement removal and replacement with Augusta right-of-way.

14.34 MEASUREMENT AND PAYMENT

Excavation and backfilling for pipelines and appurtenances, except as hereinafter provided for, will be considered as incidental to the construction of the various elements of the installation it is associated with, and no separate payment will be made therefor.

When made at the direction of Engineer, overcut, rock excavation and backfill to compensate for rock will be made at the unit contract price for rock excavation per cubic yard measured in place.

When made at the direction of the Engineer, overcut and backfill to compensate for inadequate foundation will be paid for at the unit contract price for overcut and clean stone bedding, per ton of stone.

Sheeting ordered to be left in place will be paid for at the unit contract price for sheeting left in place, per board foot.

Joints in pavements will not be paid for separately. Pavement removal and replacement will be paid for at the unit contract price therefor, per square yard.